Social Engineering

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Providing a realistic project experience is an important requirement of the Software engineering course at Otago Polytechnic. Small groups (3-4) of students work through a Systems Development Life Cycle to complete a project for a real client from planning to design specification (Smith, 2001). Many students have not previously worked in a team environment and find that successfully managing the project team can pose enormous challenges.

Teams self select, some as early as two months before the course starts. Other class members arrive hopefully on day one and form a group with those nearest to them in the classroom. Inevitably there are "leftovers" who float until placed in a team by the lecturer, with mixed success. The mechanics of group formation is discussed in class, including pointers to good group behaviours and the roles played by group members. Groups are required to complete a project management document, which outlines the roles and responsibilities of members and group management strategies.

What makes a good group? Observations in the classroom lead to the supposition that similarity is the key to successful group work. Groups consisting of students with high expectations, good work habits and similar backgrounds generally achieve well. Such groups self select and require little further input. Of more concern are the students of mixed ability and background who require guidance to form groups. If the high achievers are already in groups, how can the lecturer maximise the likelihood of success for the remaining students?

Conn (2004) describes his software engineering course as taking "the "I" out of software development". In order to create the team mindset required for a semester long group project, the optimal team configuration needs to be found. Fincher (2001) suggests a range of characteristics on which to allocate students to groups (ability, skills or demographics). Apart from the obvious (not combining all International students in one group), these methods require some prior knowledge of the students' personalities and study characteristics. What mix of factors contributes to the successful team? Some data was required in order to make a decision.

To allow this social engineering, a survey was provided to students in the first week of classes. The survey was loosely based on that used by Brown and Dobbie in their Victoria University CompSci class. (Brown,1999). Topics surveyed included goals, workload, skills, work habits, living situation and group experience. Groups formed by self-selection and were observed during the semester. An initial analysis of the survey results showed no clear criteria for manipulating existing student groups. At the end of the semester, final marks and group dynamics were noted, using student reviews as a further resource.

The following patterns were observed in successful groups:

- Mature students make strong groups
- Diversity of cultures sometimes works very well
- Mutual goals matter - all aiming for A's, or all happy with B's
- A mixture of background skills is important

These factors did not seem to contribute to group success or failure:

- Working outside the course
- Disparate work habits

Ongoing research

In order to collect further information, the survey was repeated in Semester One, 2004. Again, groups were observed without intervention. Yellow card/red card was introduced in this class (Fincher, 2001).

While allocating students to groups to improve their course outcomes would be ideal, no clear patterns are yet evident from the survey data which would justify making changes to the existing group process. As further data becomes available, it becomes important to ensure that students are aware of the success indicators for their group work. For example, students who have completed IT201 (Interpersonal Communication) have a greater awareness of the group dynamic process and can recognise damaging group behaviours early.

It is important also to define success in the course. A successful group might not attain A grades – sometimes they will achieve their goal of a B outcome for their project through an excellent group process.

Work on the raw data continues, with a further set of results and reviews available at the end of Semester One. A thorough statistical analysis of the data is planned.

References

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